Magnus Glider

Build a cup glider that demonstrates some wild physics!

Kit contains:

- 2 cups
- 4 rubber bands

You will need: tape and coloring supplies (optional.)

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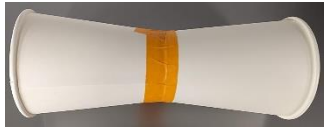
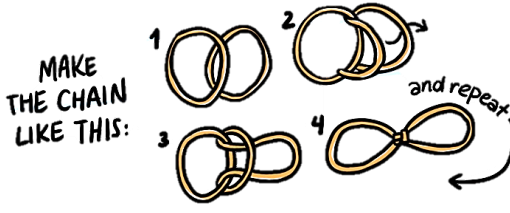
INSTRUCTIONS

Step 1. Build the Magnus glider by taping your two cup butts together. Decorate if desired.



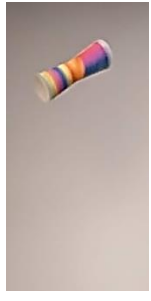
Step 2. Chain the rubber bands together to create the launcher.



SOURCES:
https://exploratorium.edu/snacks/curveball-demonstrator
https://stellarnova.co/pages/diycrafts

Step 3. Get set to launch! Use your thumb to hold the end of the rubber band chain to the center seam of your glider. Streeeeeetch and wrap the launcher around and around in the underhand direction.

Step 4. Pull your glider back, stretch the loose end of the chain forward, and release the cups!

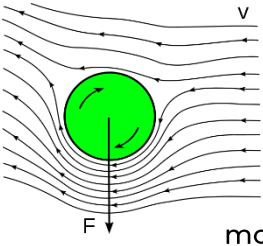


Notice how the flying glider curves upward through the air with a wicked backspin. If you get stuck, science teacher Bruce Yeany has a good video demonstration:

youtube.com/watch?v=05zF0sBwHe8

THE MAGNUS EFFECT

During the launch, your cup glider is propelled forward with a backspin. A thin layer of air, called the **boundary layer**, gets dragged along with the glider and flung downward by the backspin. Remember Newton's Third Law of Motion? Every action has an equal and opposite reaction. That downward force on the air results in an upward force on the glider. Can you predict what happens if you launch your Magnus glider sideways?



Soccer players who bend the ball and baseball players who pitch curveballs know this as the **Magnus effect**. It's a feature of airflow around a spinning body that is also moving relative to the airstream. They combine to produce a sidewise force—the ball you think would go straight curves instead!

Important note: Technically, the Magnus effect is specific to spheres. When it happens to cylinders, it's called the Kutta-Joukowsi lift. We think it's okay to *name* your glider Magnus, though.